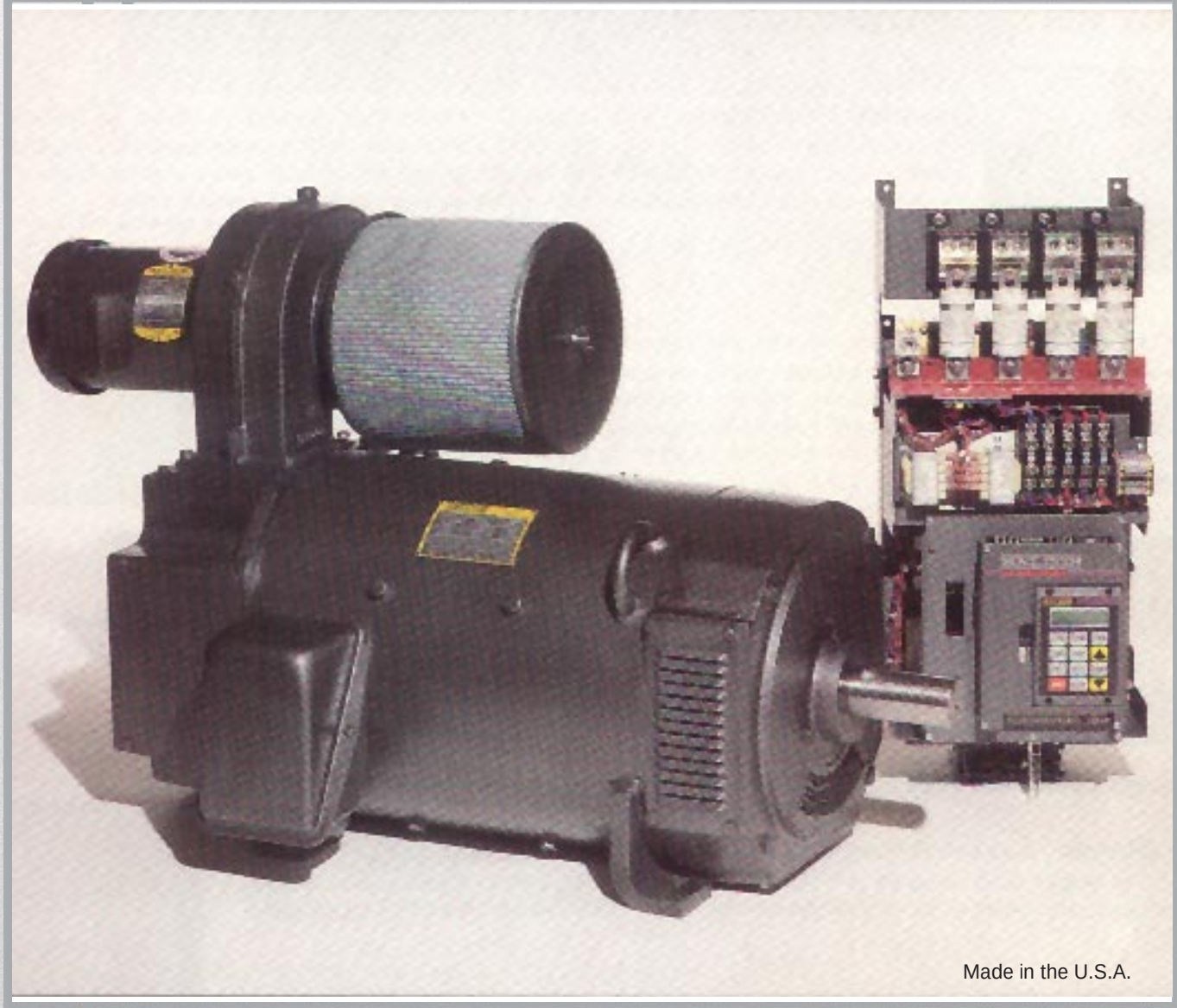


Made in the U.S.A.

Series 19H and 20H
Digital DC Controls

BALDOR®
MOTORS AND DRIVES

BALDOR
MOTORS AND DRIVES

Typical Baldor DC SCR Control Applications

Series 19H Applications

Conveyor - Baldor DC controls are the perfect solution to control the speed of a conveyor. Adjustment of the speed may be with the control's built-in keypad or with a potentiometer, process follower, switch closures (up to 15 preset speeds) or with serial communication. Adjustable acceleration, deceleration and S-curve provides smooth "jerk-free" starting and stopping.

Plastic Extruder - Baldor Series 19H DC controls are used to maintain precise speeds for consistent product from plastic extruders, blown film and coating lines. With Baldor controls, serial communication or built-in PID mode may be used for process control. Encoder or tachometer feedback ensures excellent speed regulation with varying loads.

Series 20H Line Regen Applications

Downhill Conveyors - Baldor Series 20H Line Regen DC controls provide for full load power regeneration to incoming AC power. They work well for controlling conveyor speeds either using a potentiometer, a process follower or with switch closures with up to 15 preset speeds. Acceleration and deceleration can be independently set to help eliminate spillage or material scrap.

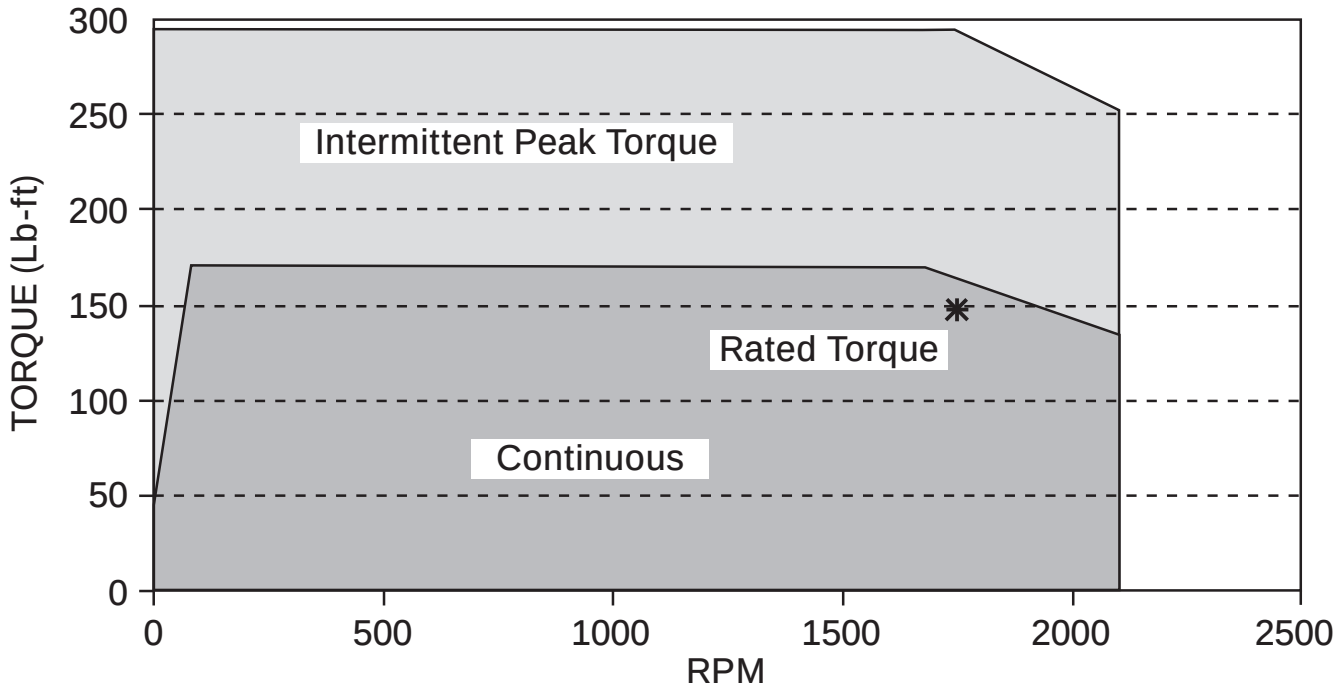
Hoists and Cranes - Baldor Series 20H Line Regen DC controls are used on applications where an overhauling load is present. Generated power from the DC motor is used for braking and excess power is fed back into the AC line. This power helps reduce energy requirements and eliminates the need for heat-producing dynamic braking resistors. Peak current of at least 250% is available from the Series 20H control for short term loads. The regen control eliminates the need for a reversing contactor when changing direction.

Web Tensioning / Winder-Unwind Stands - Baldor Series 20H controls may be operated in torque mode to provide constant tensioning on center driven rolls. Input may be from a dancer arm, tension load cell or other process control.

Test Stands - Baldor controls are used in test stands in various industries ranging from automotive chassis dynamometers to airplane starter testers. The dynamic response and precise independently adjustable speed and torque control loops provide required regulation for accurate testing.

Matched Performance™

Motor: D5050P-BV 50 HP
Control: BC20H450-CL



Enclosure is Drip-Proof Blower Cooled

Matched Performance™ is Baldor's solution to the concern, "What kind of torque and constant horsepower speed range will I get with this DC drive?". And "Do I need a drip-proof motor or should I add a blower for additional forced air cooling?" Baldor has gone beyond the usual (6:1, 10:1, 20:1) ratio-type answers and documented data from actual laboratory dynamometer testing.

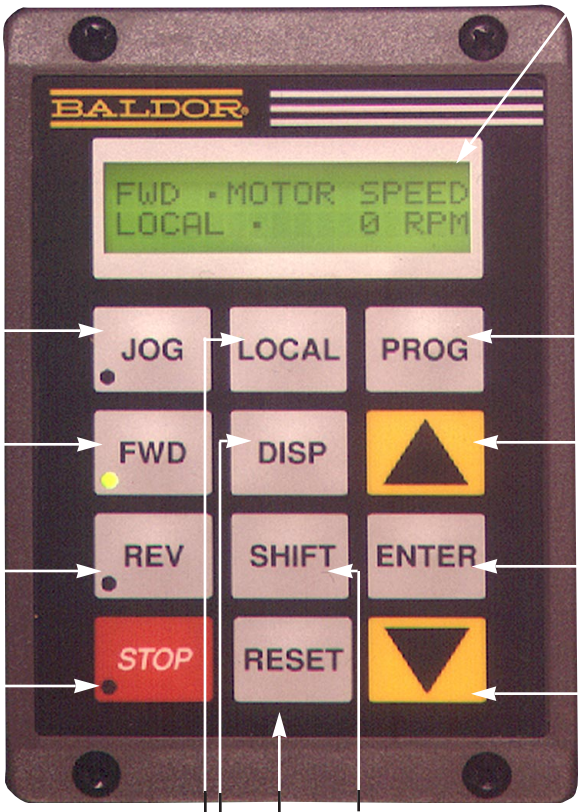
The heart of these tests is the continuous operating constant torque speed range. This range shows how much torque can be continuously supplied without exceeding a Class F temperature rise in the motor.

The horsepower curve is simply the horsepower representation of the constant torque test. Peak torque is the maximum amount of torque the motor can produce before output current is limited by the control's current limit. This intermittent torque rating may be used for starting the load, momentary overloads and acceleration / deceleration.

Each Matched Performance™ test is performed by Baldor's own testing laboratory using state-of-the-art dynamometers, thermocouples and digital power measuring equipment. A typical Matched Performance™ test requires 2-4 days of continuous testing. This painstaking effort is another example of Baldor's commitment to the drives business and to making our products easy to use.

The Baldor Keypad

Baldor has developed a new keypad which will allow the operator to enjoy the flexibility expected in today's controls and the ease of operation you have always hoped to have. Baldor includes twelve keys on the keypad. The keys depress so you "feel" that you have pushed them. We have also included a 32 character English "alpha-numeric" display. You don't have to be a detective to know what you are doing - the display helps you whether you are operating, programming or monitoring. Keypads supplied on NEMA 1 controls carry a NEMA 4 rating when remote mounted. Keypads supplied on NEMA 4 controls carry a NEMA 4X rating when remote mounted.The real advantage in this keypad is that it's easy to operate and is used on a variety of Baldor controls.



Indicator Lights

(JOG) - Green Lamp lights when JOG Speed is active.
(FWD) - Green Lamp lights when FWD direction is commanded.
(REV) - Green Lamp lights when REV direction is commanded.
(STOP) - Red Lamp lights when motor STOP is commanded.

LCD DISPLAY

Displays control status including LOCAL or REMOTE operation, motor direction command, set value of each parameter/function, monitoring values such as output voltage and current, also displays fault conditions and log.

JOG

Used to run preprogrammed JOG speed.

FWD

Used to initiate a forward direction run of the motor.

REV

Used to initiate a reverse direction run of the motor.

STOP

Used to initiate a motor stop command.

PROG

Used to access the block programming area.

UP

Used to change the display parameter or parameter value up one increment.

ENTER

Used to take the block programming menu down one level while saving any changes.

LOCAL

Used to toggle between LOCAL and REMOTE operation.

SHIFT

Used to move the blinking cursor over one space for each push of the SHIFT key.

DOWN

Used to change the display parameter or parameter value down one increment.

DISP

Depressing this key changes the displayed control status. Also used to bring the lower block programming menu back to the monitoring menu.

RESET

Used to initiate a logical reset after a fault condition and to take the block programming menu up one level.

Series 19H & 20H Features

Removable Keypad
The Baldor keypad is designed to be removed from the main control and mounted up to 100 feet away. This will allow the control to be mounted in a convenient location, and the keypad near the operator for ease of use.

English Display
The keypad displays both the operating conditions and the programming steps in easy to follow English. This eliminates the need to look up parameter numbers, program the wrong setting and all the other “easy” mistakes when working with codes.

Single Function
Each key has one function.There is not a whole set of “second operations” that each key can perform confusing the operator.

Block Programming
It is easy to adjust the control. Most controls force the operator to scroll through every parameter to get to the one desired. With block programming, the adjustments are in blocks of like adjustments. For example, if you wanted to adjust a preset speed, you would find the block that says: Press [ENTER] for preset speeds. If you didn’t want a preset speed your arrow keys take you to the next block of adjustments.

Input Terminals
The terminal connections allow control of the drive from a potentiometer (power provided), a set point controller through analog input or a PLC (or switch closures) for discrete preset speeds.

Output Terminals
The control provides two programmable analog (0 - 5VDC) outputs. These outputs can be used to run meters or as an input to other controls for “leader/follower” applications. The control also provides four optically isolated discrete outputs. They are powered by any 5 - 30VDC power supply. The outputs are programmable for settings such as Ready, At Speed, Zero Speed, Reverse, Fault, etc.

LED’S On Action Keys
There is one LED on each of the following: JOG, FWD, REV and STOP. These LED’s are “ON” whenever the COMMAND is active. When you command FORWARD - the LED in the FWD key comes on (STOP and REV are off). These LED’S are still active when you are controlling from the terminal strip, plc, switch closures, etc. The active LED lets the operator know the command has been received and accepted (no broken wires or dirty contacts).

BALDOR
MOTORS AND DRIVES

Series 19H DC Control or Series 20H Line Regen DC Control

Dynamic Braking or Line Regen?

Whenever a motor is stopped faster than it would when coasting to a stop, it becomes a generator. The energy or power generated by the motor may be shunted through a dynamic braking resistor or put back into the incoming power line. The Baldor control that directs this regenerated power through an optional external contactor to a dynamic braking resistor is the Series 19H DC Control. The Series 20H Line Regen DC Control puts the regenerated power back into the incoming line.

Which Control Is Best for Your Application?

In applications where the motor can be allowed to coast to a stop, use the standard Series 19H DC Control with no braking options required. When limited braking is required, external dynamic braking contactors and resistors may be added to the Series 19H control. Another concern with the Series 19H control is reversing. External contactors may be added to enable reversal of the motor. Baldor can supply these mounted in a panel with the control if you like.

There are many applications where a Series 20H Line Regen DC Control would be a better choice. These applications include:

- Applications having an overhauling load
- Applications with frequent reversals
- Applications with frequent stops / starts

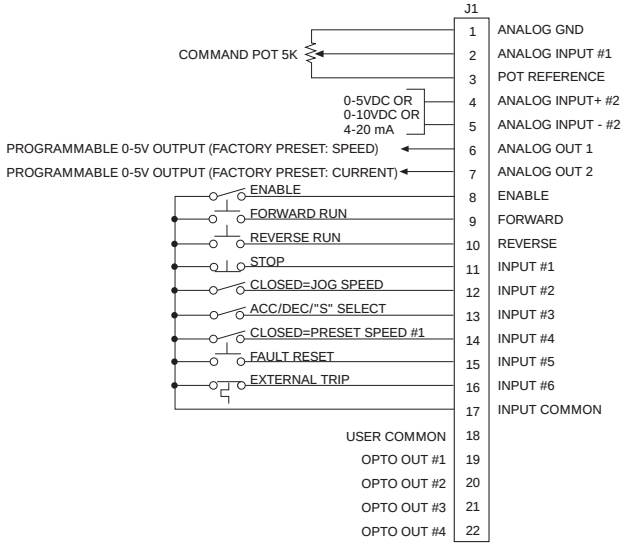
Common Interface for Ease of Installation and Use

Baldor's controls all operate and connect the same way. Once you learn how to operate and set up a DC control, you will be able to use an Inverter, Vector drive or AC Servo. All of the controls have common features:

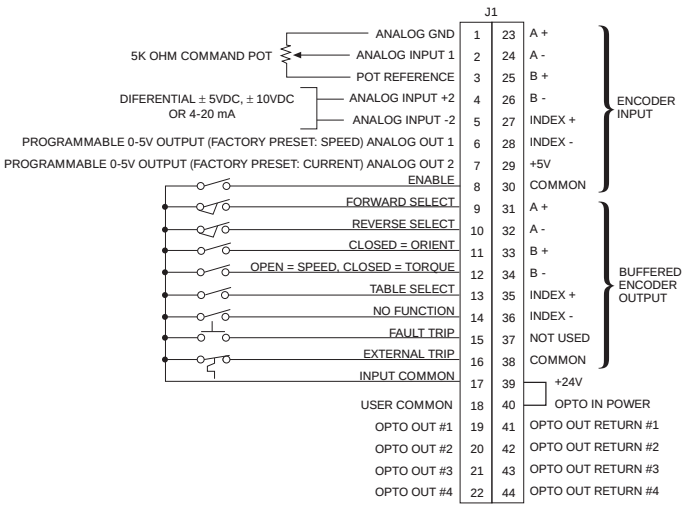
- Same Keypad
- Same English Language Commands
- Like Setup Procedures
- Same Terminal Strip Connections
- Same Programmable Inputs and Outputs
- Same Optional Expansion Boards
- Same Control Accessories (cables and regen resistors)

Braking power from the Series 20H control is regenerated back into the incoming line. No braking contactors and resistors or reversing contactors are required resulting in reduced maintenance.

Typical Standard Run 3 Wire Control



Typical Bipolar Speed or Torque Control



Series 19H DC Control Ratings

230 VAC INPUT - 240 VDC OUTPUT					
MAXIMUM OUTPUT		CATALOG NUMBER	OUTPUT CURRENT		SIZE
HP	KW		CONT	PEAK	
5	3.7	BC19H205-CO	20	40	A
10	7.5	BC19H210-CO	40	60	A
15	11.2	BC19H215-CO	60	120	A
20	14.9	BC19H220-CO	75	150	B
25	18.6	BC19H225-CO	100	200	B
40	29.8	BC19H240-CO	140	280	C
50	37.3	BC19H250-CO	180	360	C
60	44.8	BC19H260-CO	210	420	C
75	56	BC19H275-CO	270	540	C
460 VAC INPUT - 500 VDC OUTPUT					
MAXIMUM OUTPUT		CATALOG NUMBER	OUTPUT CURRENT		SIZE
HP	KW		CONT	PEAK	
10	7.5	BC19H410-CO	20	40	A
20	14.9	BC19H420-CO	40	80	A
30	22.4	BC19H430-CO	60	120	A
40	29.8	BC19H440-CO	75	150	B
50	37.3	BC19H450-CO	100	200	B
75	56	BC19H475-CO	140	280	C
100	74.6	BC19H4100-CO	180	360	C
125	93	BC19H4125-CO	210	420	C
150	112	BC19H4150-CO	270	540	C
200	150	BC19H4200-CO	350	875	D
250	187	BC19H4250-CO	420	840	D
300	224	BC19H4300-CO	500	1000	D

Series 20H Line Regen DC Control Ratings

230 VAC INPUT - 240 VDC OUTPUT					
MAXIMUM OUTPUT		CATALOG NUMBER	OUTPUT CURRENT		SIZE
HP	KW		CONT	PEAK	
5	3.7	BC20H205-CL	20	60	A
10	7.5	BC20H210-CL	40	120	A
15	11.2	BC20H215-CL	60	150	A
20	14.9	BC20H220-CL	75	190	B
25	18.6	BC20H225-CL	100	250	B
40	29.8	BC20H240-CL	140	420	C
50	37.3	BC20H250-CL	180	480	C
60	44.8	BC20H260-CL	210	540	C
75	56	BC20H275-CL	270	680	C
460 VAC INPUT - 500 VDC OUTPUT					
MAXIMUM OUTPUT		CATALOG NUMBER	OUTPUT CURRENT		SIZE
HP	KW		RMS AMPS	PEAK AMPS	
10	7.5	BC20H410-CL	20	60	A
20	14.9	BC20H420-CL	40	120	A
30	22.4	BC20H430-CL	60	150	A
40	29.8	BC20H440-CL	75	190	B
50	37.3	BC20H450-CL	100	250	B
75	56	BC20H475-CL	140	420	C
100	74.6	BC20H4100-CL	180	480	C
125	93	BC20H4125-CL	210	540	C
150	112	BC20H4150-CL	270	680	C
200	150	BC20H4200-CL	350	875	D
250	187	BC20H4250-CL	420	1050	D
300	224	BC20H4300-CL	500	1250	D
400	298	BC20H4400-EL	670	1340	G NEMA 1
500	373	BC20H4500-EL	840	1680	G NEMA 1
600	448	BC20H4600-EL	960	1920	G NEMA 1

DESIGN SPECIFICATIONS
GENERAL SPECIFICATIONS

- Input Voltage
  180-264 VAC 60Hz 180-230 VAC 50Hz
  340-528 VAC 60Hz 340-460 VAC 50Hz
- Input Frequency: 50 or 60 Hz±5%
- Three phase, full wave SCR armature control, NEMA type C
- Line regen on Series 20H
- Max output voltage to armature - 125% of AC line - Series 19H; 108% of AC line - Series 20H
- Current regulated power supply, max output voltage 85% of input line voltage, 15 amps standard, (40 amps optional) with field economy circuit
- High peak overload, 200% minimum on Series 19H, 250% minimum on Series 20H
- Selectable operating modes: Keypad; Standard Run, 3-wire; 15 Preset Speeds, 2-wire control; Bipolar speed / torque; Serial; Process follower mode. Series 20H also has Bipolar Hoist and 7 Speed Hoist modes.
- Automatic tuning to motor with manual over-ride
- Motor shaft orient to encoder marker or external switch closure
- Process follower: ±5 VDC, 0-5 VDC, ±10 VDC, 0-10 VDC, 4-20 mA, digital via keypad or optional RS232 or RS422/485
- Programmable linear or S-curve acceleration0-3600 seconds
- 15 preset speeds (7 in Series 20H Hoist mode)
- Min / max speed settings
- Analog meter outputs
- Buffered encoder output
- 9 isolated inputs
- 2 assignable analog inputs
- 4 assignable logic inputs
- Chassis mounting

ENVIRONMENTAL AND OPERATING CONDITIONS

- Service Factor: 1.0
- Continuous Duty
- Ambient Temperature: 40° C maximum
- Humidity: 90% max RH, non-condensing
- Altitude: 3300 feet without derating
- Line impedance - 5% maximum

PROTECTIVE FEATURES

- Adjustable current limit
- Motor overload and overcurrent
- Over-temperature (motor and control)
- Control input over and under voltage
- Motor overspeed
- Field loss
- Encoder, tach or resolver loss
- Phase loss
- Torque proving
- Selectable manual or automatic restart at power loss
- Digital display of fault codes
- Input line, field power supply and armature fuses

OPERATOR KEYPAD

- Digital speed control
- Forward / Reverse command
- Motor RUN and JOG
- LOCAL / REMOTE keys
- STOP command
- Parameter setting and display
- 32 character alpha-numeric display
- Membrane keys with tactile-feel
- Remote mount to 100 feet from control
- NEMA 4X enclosure on keypad

MOTOR FEEDBACK

- Standard armature or incremental encoder coupled 1:1 to motor shaft
- Encoder pulses / rev: 60-65535 programmable
- Encoder specs: 1024 PPR standard, 2 channels in quadrature, 5 VDC, differential.
- Encoder marker pulse required for orientation (homing)
- Power output: +5 VDC, 300 mA max
- Max frequency: 1 MHZ
- Positioning: Buffered encoder pulse train output for position loop control
- Optional feedback: DC tachometer or resolver with addition of optional expansion board
- Tachometer, Encoder, or Resolver feedback is required for motor operation above base speed

Keypad Extension Cable

For the convenience of our customers, we offer a connected plug/cable assembly. This assembly provides the connectors from the keypad to the control for remote keypad operation.

Encoder Connection Cable

Also available form stock are cables to connect the motor-mounted encoder to the control. These are provided with the appropriate connector and are available in several lengths of 5 to 200 feet.

CATALOG NO.	CABLE EXTENSION LENGTH	APPROX SHPG. WGT.
CBLH015KP	5 FEET (1.5 METER)	2
CBLH030KP	10 FEET (3.0 METER)	2.5
CBLH046KP	15 FEET (4.6 METER)	3
CBLH061KP	20 FEET (6.1 METER)	4
CBLH091KP	30 FEET (9.1 METER)	5
CBLH152KP	50 FEET (15.2 METER)	6
CBLH229KP	75 FEET (22.9 METER)	9
CBLH305KP	100 FEET (30.5 METER)	11

Expansion Boards

Baldor offers a wide variety of plug-in expansion boards to allow the Series 19H and 20H DC controls to be interfaced with various inputs and outputs. One or two expansion boards may be mounted into the control to custom tailor the inputs, outputs, and feedback requirements to the application. Baldor also offers several expansion boards that will allow direct interfacing with popular PLC's.

Group 1 Boards

Isolated Input Board - EXB003A01

This board replaces the opto inputs on the main control board with isolated relay inputs and are jumper configurable for 10-30 VDC, 10-30 VAC, or 90-130 VAC. All inputs must be in the same voltage range and one side of all inputs is common. Screw terminals are provided for easy connection.

Master Pulse Reference/Pulse Follower - EXB005A01

This board is jumper selectable to create a master pulse reference based on the controls speed/direction command or selected as an isolated pulse follower. The follower can be ratioed up or down to the master pulse through the control keypad. The master or follower pulse train can also be configured as a two channel quadrature pulse with complements or configured as a one channel pulse train for speed and one channel for direction. As a follower, the pulse train will be retransmitted to the next follower as received from the master.

DC Tach Interface - EXB006A01

Allows a DC Tachometer to be used as a feedback or command signal to the controls built-in PID Set Point Controller. Jumper selectable for 7, 10, 15, 20, 30, 50, 60, 100, 200, 250 VDC per 1000 RPM tachometers with a software trim for 10% tolerance. Screw terminals are provide for easy connection.

Isolated Encoder Feedback - EXB008A01

Allows an encoder to be used as a feedback or command signal to the controls built-in PID Set Point Controller. An isolated power supply is jumper selectable to provide 5, 12, and 15 VDC to power the encoder. A retransmit signal is also provided to retransmit two channels in quadrature with complements or jumper selectable for one channel and index channel both with complements.

Group 2 Boards

RS232 Serial Communication - EXB001A01

Allows serial communication for commands and monitoring using half of full duplex with up to 19.2K baud maximum. A DB-9 connector is supplied for easy connection to expansion board.

RS422/RS485 Serial Communication - EXB002A01

Allows serial communication for commands and monitoring. RS422 can be transmitted in half or full duplex. RS485 is transmitted in half duplex. 115.2K baud maximum transmission rate. Screw terminals are provided for easy connection.

Four Output Relay/3-15 PSI Pneumatic Interface - EXB004A01

Converts 3-15 PSI air pressure to 0-10 VDC or 10-0 VDC (inverted) to be used as a command or feedback signal. Also includes four output relays to replace the four opto outputs on the main control board. Two relays are jumper selectable for N.O. or N.C., rated for 115 VAC , 3 Amps max and two form "C" relays (N.O. and N.C.). Screw terminals are provided for relay connections and air hose connects to 1/8" O.D. nipple on expansion board.

High Resolution Analog Board - EXB007A01

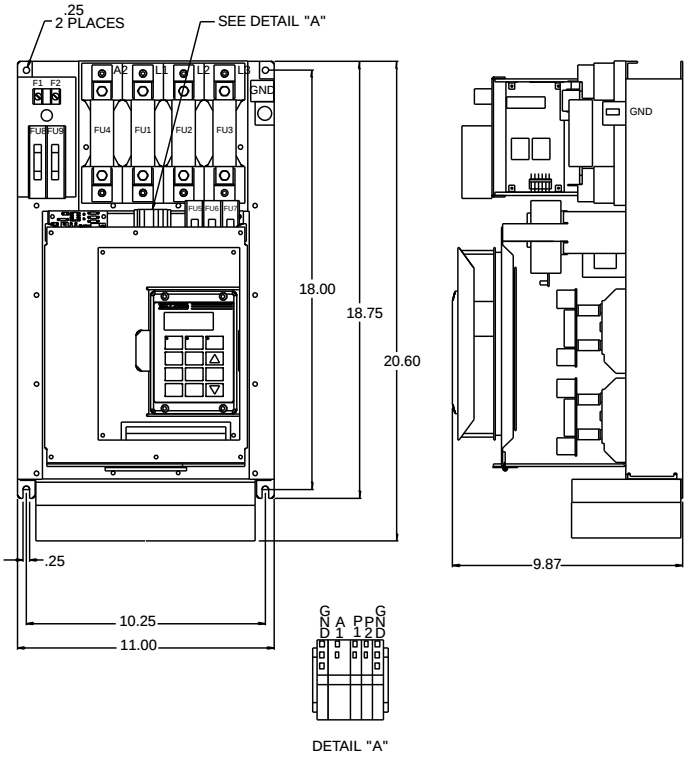
Contains one high resolution input channel to replace Analog Input #2 on the main control board. The resolution will be as follows: ±10 VDC = 16 bit, 0-10 VDC = 15 bit, ±5 VDC = 15 bit, 0-5 VDC = 14 bit, 4-20 mA = 15 bit. Also contains two high resolution analog outputs to replace Analog Output #1 and #2 on the main control board. The outputs are selectable for ±10 VDC, 0-10 VDC, and 4-20 mA with inverting capability. Screw terminals are provided for easy connection.

Group 1 and Group 2 Ordering/Mounting Information

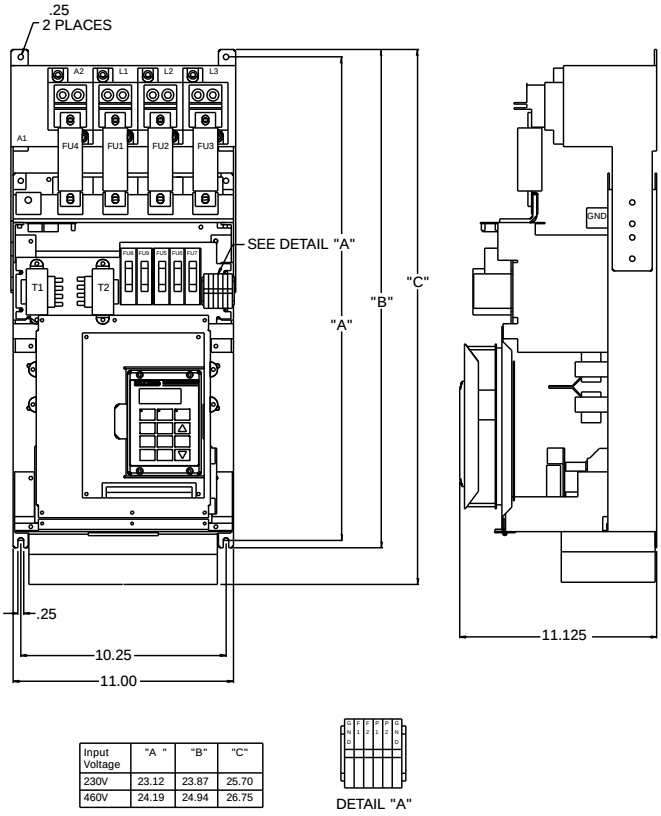
- NOTE: Expansion boards plug into the main control board inside the control. When using one expansion board, either a Group 1 or Group 2 board will connect to the main control board. When two expansions boards are used, one must be from Group 1 and one from Group 2. The Group 1 board will connect to the main control board and the Group 2 board will connect to a stacking connector on the Group 1 board.

Layouts

Size A Controls

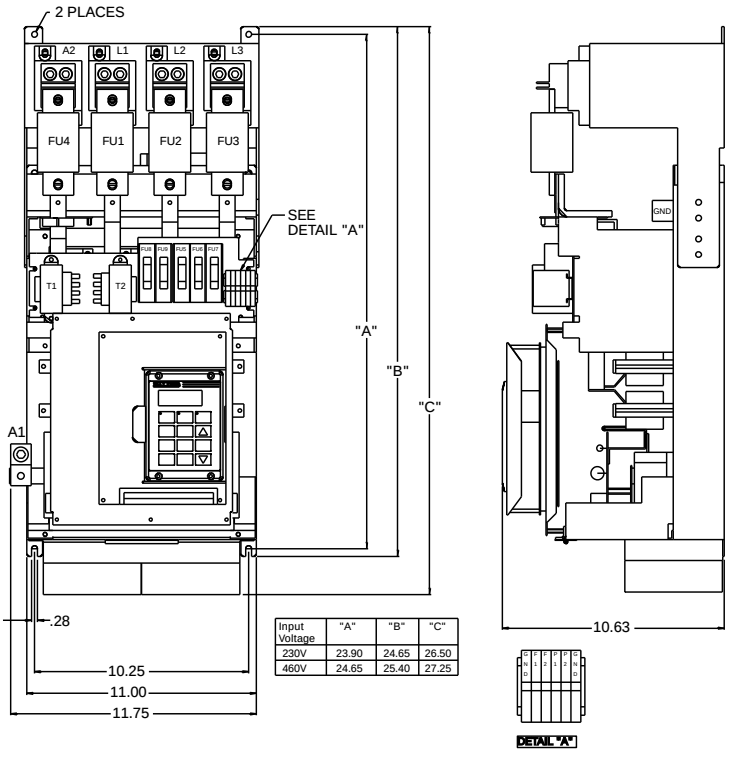


Size B Controls



Input Voltage	"A "	"B"	"C"
230V	23.12	23.87	25.70
460V	24.19	24.94	26.75

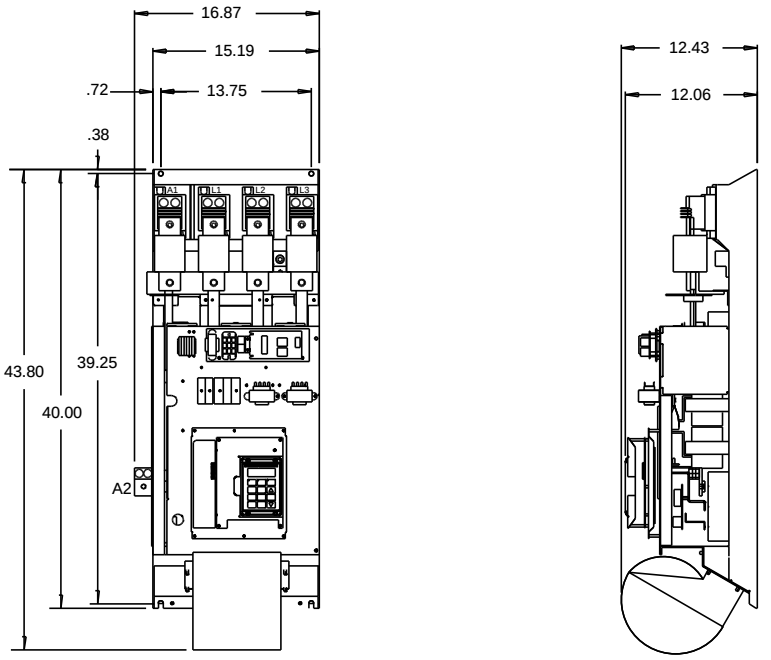
Size C Controls



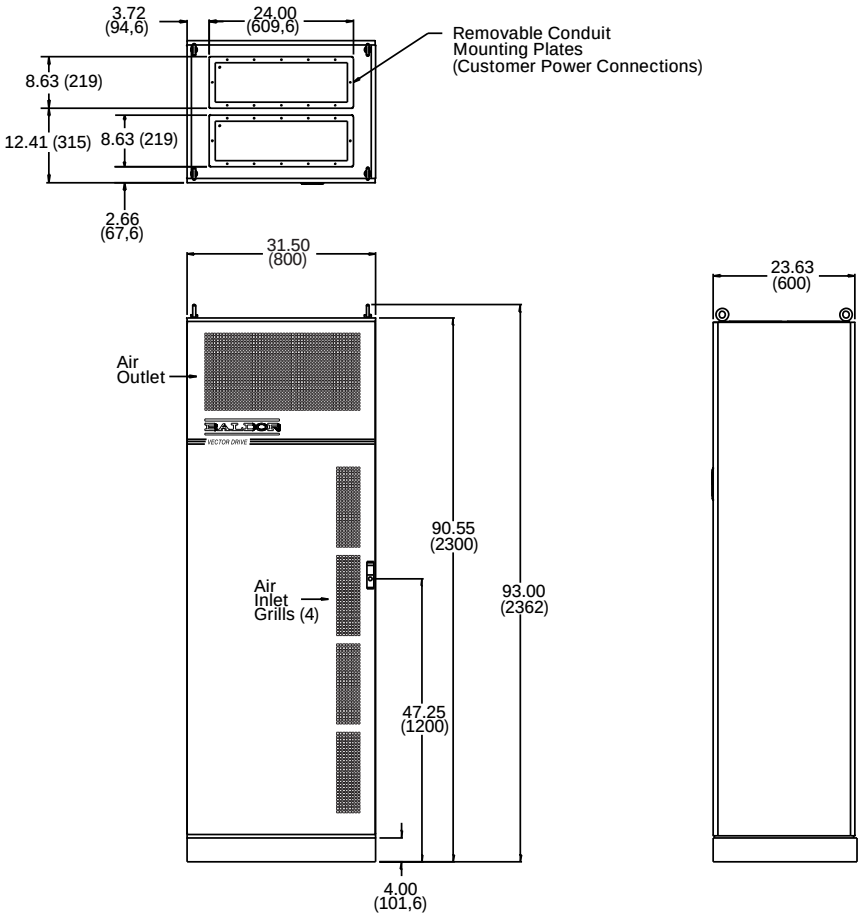
Input Voltage	"A"	"B"	"C"
230V	23.90	24.65	26.50
460V	24.65	25.40	27.25

Layouts Cont...

Size D Controls



Size G Controls



BALDOR
MOTORS AND DRIVES

Other quality products from Baldor to serve your Motor and Drive needs.

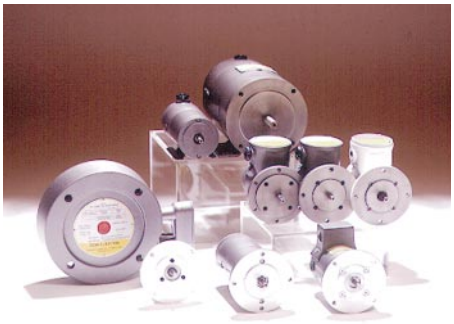
No one offers a broader line of motors and controls than Baldor–no one!

Inverter & Vector Drive Motors

Baldor Inverter Drive Motors are designed for the tough application requirements found in today's industrial environment. Premium efficiency designs increased energy savings, lower temperature rise and increase motor life. Standard features include:

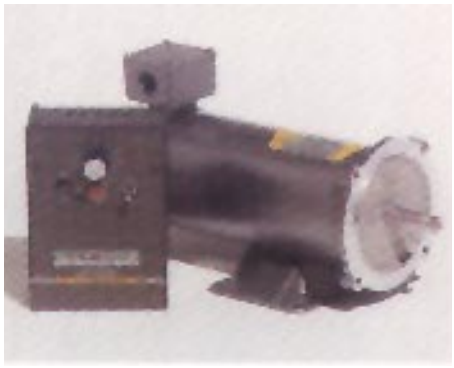
- TENV and TEBC enclosures
- Full class H insulation
- Stock ratings of 1/3 to 200 Hp
- Standard foot and C-Face mounting
- Precision Balance to 6000 RPM (1/3-10Hp) and to 4000 RPM (15-200Hp)

Baldor Vector Drive Motors are designed for vector control adjustable speed applications. The use of Class H insulation increases motor life. These premium efficiency designs also increase energy savings and lower the temperature rise. All motors include both foot and C-Face mounting. Normally, closed thermal overload protectors are imbedded in the motor coils for overtemperature warning. Both Totally Enclosed Non-ventilated (TEMNV) and Totally Enclosed Blower Cooled (TEBC) designs have been tested on adjustable speed controls to ensure maximum performance and adequate cooling over the entire speed range. Integral HP rating feature a cast iron construction for extra durability. All feature the proven H25 encoder with quadrature output 1024 line/rev mounted and tested. Ratings from 1/3 - 200 HP are available from stock.



Tachometers

Baldor offers a wide range of DC, AC and encoder-based digital tachometers to fit nearly any application. Standard PY-style flange mountings are available for DC and digital tachs. PY type tachs are also available with base mounting. Larger XC42 and XC46 style heavy duty DC tachs are also available with 56C face and foot mounting. Our new XPY-II tach with its low ripple and cast iron housing is now available from stock. A metric mounting as well as a Washdown DC tach are also in stock. DC tachs are available with 50, 100 and 200 volt / 1000 RPM output. DC and AC pancake tachs are available for mounting to the accessory face of most integral Hp DC motors.



DC Motors and Drives

Baldor DC SCR Drives are available for 1/50-300 Hp. Non-regenerative controls are available 1/50-5Hp; regenerative controls for 1/25-300 Hp.

- Permanent Magnet DC 600 Motors 1/50-5 Hp
- Wound Field Motors 1/8-5 Hp
- Metric Face and Flange
- Explosion Proof 1/8-3 Hp

PMDC Motors & Controls

Baldor's family of PMDC motors in 1/50 to 5 horsepower provides a specific motor for many applications. We offer motors with both NEMA and IEC Metric Mounting. Enclosures range from standard TENV and TEFC to washdown for applications requiring hose-down of equipment. Motors are tach adaptable and one model has a built-in tach. These PMDC motors may be matched with our SCR Controls.

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